Guide for the Small Public Water System

"How to Hire an Engineer"

November 1992

Environmental Health Programs
Division of Drinking Water

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How to Hire an Engineer

Public water systems often need the services of a professional engineer when improvements to the water system are needed. Large, privately owned systems and city or water district systems frequently have an engineer on staff or under contract. The smaller water system must hire an engineer as the need arises.

Hiring an engineer may present a problem for the small system. The system may have limited or no prior experience in hiring an engineer and may not know what questions to ask or what criteria to use in the selection process.

This is a guide for the small public water system on "How to Hire an Engineer." The guide is in a question and answer format, with the questions answered which are most likely to arise in the process of finding and hiring an engineer.

1. Why would a water system need to hire an engineer?

An engineer performs the following engineering services in relation to the planning, design and construction of water systems:

a) Identifying source, storage, or water distribution system problems;

b) Analyzing alternate solutions to these problems;

c) Assuring that the system designed will function properly and be efficient and economical;

d) Preparing detailed construction documents to implement the selected solution to the problems;

e) Assisting in obtaining plan approval and obtaining bids from contractors to perform the work;

f) Inspecting and testing the quality of the contractor's work and making necessary reports and recommendations to the water system;

g) Completing Department of Health (DOH) certification documents to the extent that the engineer has direct knowledge of the as-built facilities.

2. What kind of engineer is needed?

There are many categories of engineering specialties. The categories include, but are not limited to, Civil, Consulting, and Sanitary Engineers. The engineer selected must be a Professional Engineer (PE) licensed by the state of Washington, should have experience with public water systems, and should be satisfactory to the Department of Health. It is not legal for engineers or land surveyors to undertake assignments for which they are not qualified (196-27 WAC).

3. What is a Professional Engineer (PE)

A Professional Engineer is a person who has had specialized college education and engineering experience and who has been examined and annually licensed by the state of Washington.

4. Why must a water system hire a PE?

a) There are numerous technical details involved in designing and installing a water system. Details such as friction loss, valve sizing and placement, soil conditions, and treatment alternatives require the expertise of a trained individual. A professional engineer will have the knowledge and experience to deal with these technical details.

b) State law (WAC 246-290-040) requires certain documents relating to public water systems be prepared by a PE licensed in the state of Washington. These documents are all water system plans, project reports, and construction documents for new public water systems, extensions and alternations (except maintenance or replacements of other minor projects not requiring engineering expertise).

c) State law (WAC 246-290-040) also requires a certificate signed by a PE be submitted to the Department of Health within 60 days following completion of and prior to use of any project approved by the department. The certificate states that the PE has inspected the project and that it has been constructed in accordance with the construction documents approved by the department.

5. How does a water system find an engineer with expertise in water systems?

There are several ways of finding engineers that may be interested and capable of providing the needed services.

a) Consult the yellow pages of the telephone books for larger towns and cities. Listed under “Engineers” will be various categories of engineering specialties.

b) Contact other water systems to determine which engineers have provided them with satisfactory service.

c) Consult directories such as those published by the Consulting Engineers Council of Washington or the National Society of Professional Engineers.

6. What criteria should be considered in selecting an engineer?

The primary considerations in selecting an engineer are relevant experience in the types of services needed and demonstrated ability to serve in a timely and effective manner. The basic criteria which should be used in the selection process include:

a) Knowledge - The engineer should have specialized education or training in the aspect of public water system engineering that the small water system needs.

b) Experience - The engineer should have professional engineering experience with similar water system projects.

c) Ability to Serve - The engineer should demonstrate that sufficient uncommitted time and other resources are available to perform the services within the time needed by the water system.

d) Communication - The engineer should demonstrate the ability to communicate in a thorough and timely manner as needed to keep the water system fully and satisfactorily informed.

e) References - The engineer should provide three or more references from previous clients for whom similar water system engineering services have been performed. In addition to a contact person, information on the type of project, year the project was undertaken, total actual versus estimated cost of the project, and the engineer in charge of the project should be provided.

If an engineering firm is hired, these criteria should apply not only to the engineering firm, but also to the engineer who will actually be doing the work. Many large engineering firms have people who meet all these criteria but they will not actually be working on each of their clients’ projects.

7. What procedures should be used to select an engineer?

a) Contact at least three engineers, briefly discuss what engineering work is needed and find out if they are interested.

b) Interview three or more of the engineers expressing an interest, based upon the selection criteria previously outlined.

c) Contact the reference and ask how the engineer performed the assignment.

d) Rank the engineers in order of preference.

e) Request for first-ranked engineer to submit a written proposal. The proposal should include such details as what work will be accomplished, how the work will be done, how much time it will take, what fees will be charged, and what payment method will be acceptable.

f) Meet with the engineer, if necessary, to discuss any items not fully addressed in the proposal.

If the terms and conditions of a contract are mutually acceptable, let the other engineers who were interviewed know of the selection. If contract terms cannot be mutually agreed upon, end negotiations with the engineer and begin to negotiate with the second ranked engineer.

8. What services should the engineer perform?

There is no standard "package of services" that engineers perform. The services are tailored to the specific needs of each small water system.

However, there are generally three phases of a design and construction project that the engineer is involved in: planning and preliminary design; final design; and construction.

a) Planning and Preliminary Design Phase - Involves studying the problem, determining alternate solutions, outlining the basis concept, making preliminary cost estimates, and establishing project feasibility. The water system should not go into a project with a preconceived idea of what is needed. The engineer should not be expected to just give a "seal of approval," but should actually perform the required analysis.

b) Final Design Phase - Includes design, field work, preparation of construction documents and cost estimated, as well as submittal to and obtaining approval of all required agencies.

c) Construction Phase - May involve construction stakeout, surveillance and/or inspection of the contractor's work during construction, review of contractor's progress payment requests, and other matters required to assist the system in the construction phase. Preparation of as-built drawings and completion of the as-built certification is also often included in this phase.

9. Water System Plans

The engineer should be familiar with Washington State water system planning requirements, including WAC 246-290, financial viability analysis and guidelines published by the Department of Health.

10. How are the costs of engineering services determined?

Engineering fees may be based on a set fee per day, cost times a factor, lump sum, or percentage of project cost. Details such as "Will travel time be an additional charge and, if so, at what rate?" and "Will the fee include all consultations or will each meeting be an additional charge?" should be established. Whatever financial arrangements are made, the specifics of services to be performed and how they are to be reimbursed should be fully agreed upon before a contract is signed.

By using this guide, the small public water system should be able to select and contract with an engineer that will satisfactorily perform the needed services when water system improvements are necessary.

If you have any further questions, contact your DOH Drinking Water Operation Regional Office:

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